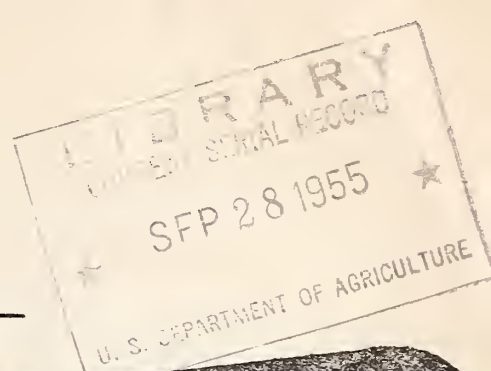


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Review



AN OUTLINE FOR

Teaching Conservation

IN ELEMENTARY SCHOOLS

U. S. DEPARTMENT OF AGRICULTURE

U. S. Soil Conservation Service

PA-268

PREFACE

This is one of two outlines for teaching conservation assembled by the Soil Conservation Service. The other deals with junior and senior high schools.

This outline is an expansion and revision of materials originally developed in a series of five regional conferences in which educators from several parts of the country participated. All levels of educators, from classroom teachers to top administrative officials, attended these conferences. Representatives of the Office of Education, Forest Service, Fish and Wildlife Service, National Association of Biology Teachers, National Science Teachers Association, and Conservation Education Association collaborated in the expanded outline and reviewed the manuscript.

The wide differences in conservation problems and educational systems throughout the Nation made it impractical to draw up a teaching plan. The purpose of this outline is simply to furnish some broad ideas for State, county, and independent school systems to use as a general guide in teacher-pupil planning for learning. Teachers will then be able to help children adapt these ideas to local conditions.

Soil and water are so closely related to other natural resources that any outline for teaching conservation of soil and water will inevitably include some conservation of other resources. Emphasis, however, is on soil and water conservation because soil and water are the basic resources that support all life.

Conservation education in the elementary school curriculum is getting more and more attention. Educators agree that it is as important to teach conservation of soil and water to urban children as to rural children. In fact, many feel that it is even more important to emphasize it in urban schools. Rural children live closer to nature and may be exposed to some conservation problems during home and community experiences. There is little chance, however, for urban children to recognize the significance of conservation unless it is included in the school program.

This outline is prepared so that it can be adapted to the many State courses of study that now emphasize conservation. The material for grades 1, 2, and 3 might be integrated into units already being taught, such as home, school, community, nature, and weather. The material for grades 4, 5, and 6 might also be combined with units already being taught, such as social and science studies. In those schools where the course of study is based on subjects rather than units, the material outlined for grades 4, 5, and 6, particularly, can be integrated into such subjects as geography, history, science, and reading. The seventh- and eighth-grade material may not be applicable in urban schools where these grades are included in junior high school.

Suggestions for teaching conservation in the first grade through the eighth are contained in the outline. Under each of these grade-level sections are four main divisions: (1) Objectives, (2) Things To Talk About, (3) Suggested Activities, and (4) space for "Notes."

Other sections include: Addresses of Soil Conservation Service State offices (where information about Soil Conservation Service, including SCS publications, can be obtained), Visual Teaching Aids, References, and Books for Teachers and Advanced Students.

AN OUTLINE FOR TEACHING CONSERVATION IN ELEMENTARY SCHOOLS

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5a
Washington, D. C.

5c
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FIRST GRADE

GETTING ACQUAINTED WITH PLANTS, ANIMALS, AND THE SOIL

Objectives

- To get acquainted with the common plants and animals and the soil in the community.
- To understand that most of the food we eat and the clothes we wear come from plants and animals.
- To understand that plants and animals depend upon the soil.
- To develop an appreciation of the usefulness of plants, animals, and soil.
- To understand why we should take care of plants, animals, and the soil.

Things To Talk About

- Plants and animals that furnish the different kinds of food we eat.
- Plants and animals that furnish the clothes we wear.
- Trees that furnish the wood for our homes and furniture and for making paper.
- The soil—a home for plants.
- Soil and water—a source of food for plants.
- Plants as food for animals.
- Some ways we take care of vegetable and flower gardens and grass on the lawns—planting, weeding, harvesting, fertilizing, watering, protecting from insects and diseases.
- Why and how the farmer or rancher takes care of his crops and livestock—planting, protecting, and harvesting crops, feeding and housing livestock.
- Why and how the farmer takes care of his soil—plowing and harrowing.

- Wild birds and animals that are of value to man.
- Why and how we help take care of our wild birds and animals.

Suggested Activities

- Make field trips to nearby farms, gardens, orchards, woods, and parks to study leaf litter and different kinds of plants, trees, fruits, and wildlife.
- Visit grocery and fruit stores to study different kinds of fresh and canned vegetables, fruits, and meats.
- Make and color pictures of animals and plants in the community and learn to recognize their names when you walk in parks or fields.
- Plant flower seeds in a pot or box of good soil and the same kind of flower seeds in a pot or box of poor soil. Tend them for a month and report on difference in growth, appearance of plants, and appearance of soil. Note how water soaks readily into good soil but stays on top of poor soil. Note also that a hard crust forms on the top of the poor soil.
- Help plant and care for the garden, flowers, or lawn at home.
- Make a balanced aquarium.
- Plant seeds in two pans. Keep the soil in one pan well watered, but do not water the soil in the other one. This will show that water is necessary to make the seeds grow.
- Mix water with different kinds of soil to learn how soils differ.
- Sandbox activities, using different soils to learn how soils differ.

Notes

SECOND GRADE

MAN'S USE AND CARE OF PLANTS, ANIMALS, AND SOIL

Objectives

- To become conscious of the need for conservation.
- To understand how man depends on plants and animals.
- To understand how plants and animals depend on soil, water, and sunshine.
- To learn something about the soil.
- To learn how the soil may be eroded by wind and water.
- To gain some knowledge about the usefulness of fish and wildlife to man.
- To learn which natural resources need to be conserved.

Things To Talk About

- Kinds of food and clothing we get from wildlife animals.
- Kinds of food and clothing we get from domestic animals.
- Kinds of food and clothing we get from different plants.
- The things we use that come from the forests.
- How wild birds and animals help man.
- The dependence of plants on soil, water, and sunlight for growth.
- The dependence of animals on plants or plant products.
- What the soil is made of—minerals, dead roots, leaves and stems, worms, water, air.
- How soils differ: Sand, silt, and clay; topsoil and subsoil; black, red, yellow, and gray soil. What makes the soils different?
- Rich soil and poor soil—rich soil makes good crops; poor soil makes poor crops.
- How water and wind wash and blow the soil away—rich soil can become poor soil.
- How grass on the lawn at home and on the school grounds and parks keeps the soil from washing and blowing away.
- Some ways a farmer can keep his soil from washing and blowing away—trees, grass, and crops protect the soil.
- How wild birds and animals store food for winter.
- How man stores food for winter.

Suggested Activities

- Have a "plant-growing race" by using different kinds of soil in each of several flower pots or boxes—rich garden

soil, forest soil, soil from rich farmland, soil from eroded farmland, soil from pasture or ranch land, subsoil, coarse sand, road dust.

Make trips to farms, woods, parks, zoo, museum, grocery store, and fruit store to learn to identify plants, animals, and food.

Make drawings of animals, birds, and plants in the community.

Make color drawings and photographs of natural subjects, such as trees, flowers, and rivers to arouse interest in nature and in our basic resources—soil and water.

Make some raw soil by rubbing two soft rocks together. Make a trip to a nearby area where soil blowing has removed good topsoil.

Make a trip to a well-sodded sloping area. Dig up a clump of sod and note how soil clings to the grass roots. A good sod holds soil in place.

Soon after a rain, make a trip to a nearby farm, field, or vacant lot where the ground is bare and watch the water wash the topsoil away. Observe how soil washed from sloping fields is deposited on lower level lands. Observe that soil did not wash off grass-covered areas. Observe how barriers that slow or break the force of running water cause silt to be deposited.

Study different kinds of soil samples collected by pupils on field trips to see how they differ in color and texture.

Tell class about trips and about animals, birds, plants, and the soil.

Make a list of animals:

Those raised as pets around homes.

Those grown on farms and in parks.

Those growing wild in the community. Which ones should be conserved?

Make a list of plants:

Those grown for food and erosion control on farms and in gardens and orchards.

Those grown for wildlife food and cover.

Make a trip to an industrial plant and observe which natural resources it uses and how they are used.

Make a miniature farm in the classroom and show conservation practices.

Measure amount of silt in a jar of muddy water taken from a stream after a rainstorm.

Notes

THIRD GRADE

NATURAL RESOURCES OF THE NATION AND COMMUNITY

Objectives

- To become conscious of the need for conservation.
- To learn what our natural resources are and how they were created.
- To develop an appreciation of natural resources and their usefulness to the individual, community, and Nation.
- To gain some knowledge of natural processes—weather, climate, water and wind action, soil formation.
- To gain an understanding of man's dependence on the soil and other natural resources.

Things To Talk About

- Forests of the United States—during pioneer days and now.
- Grasslands of the United States—during pioneer days and now.
- Wildlife of the United States—during pioneer days and now.
- Fish of the United States—during pioneer days and now.
- The soil—our greatest resource.
 - What the soil gives us—trees, grass, fruits, vegetables, meat, milk, cotton, wool, lumber.
 - How much good cropland do we have? How many people will it feed?
 - How soil is formed—how topsoil is formed—how trees, grass, and animals help to make soil.
- Resources on which our community depends.
 - Where do the different foods we eat come from?
 - What foods grow near our school?

- Where do we get the wool and cotton for our clothes?
- Where does the timber we use come from?
- How water, soil, and forests support industries of the community.
- How natural resources affect occupations of the community—without timber, lumber mill workers and builders would be idle.
- How natural resources affect community life in other places—a tribe of nomads; a fishing village; early Indians; a mining town; an industrial city; a farming community.
- How climate and weather affect the kinds of plants and animals that grow in a region.
- How climate and weather affect the lives of people.
- How climate and weather affect the land—soil washing and blowing.

Suggested Activities

- Try "What is it?" tests—ask pupils to bring samples of different soils, plants, seeds, flowers, woods, and animal skins, and let other pupils identify them.
- Make field trips to study soils and soil formations—study soil profiles at roadside cuts and note differences between topsoil and subsoil; note differences between soils in forests, grasslands, fields, and gardens.
- Make field trips to study trees, wildflowers, and other plants, and wildlife.
- Tell the class about these field trips.
- Study weather reports. Keep a daily weather chart.
- Build a balanced aquarium or terrarium.

Notes

FOURTH GRADE

DEPLETION OF NATURAL RESOURCES—SOIL EROSION

Objectives

- To realize that many of our natural resources are being seriously depleted.
- To learn how man and nature use up and destroy resources.
- To study some types of misuse that needlessly destroy resources.
- To study soil erosion and its effects on the land and on streams.
- To develop an understanding of how the depletion of resources changes the way we live.
- To develop an appreciation of the need for conserving resources.

Things To Talk About

- Soil erosion—its extent and severity in the community and Nation.
- What is soil erosion? Sheet erosion? Gully erosion? Wind erosion?
- How many acres have been damaged and ruined in the Nation by erosion? How many acres of good land do we have left? How much land in your State or community is being damaged by erosion? Are there any abandoned fields or farms in your community?
- Causes of soil erosion—steep slopes; bare land; rain; changes in temperature, such as freezing and thawing and high winds.
- Effects of soil erosion.
 - Decreased crop yields caused by less plant food.
 - Less water-holding capacity of the soil.
 - Abandoned farmland—gullies prevent cultivation.
 - Silting of reservoirs, streams, and harbors.
 - Effect of silt on fish and their spawn.
 - Lowering of ground-water table; more floods; muddy and dry streams; dry springs and wells.
 - Duststorms on the Great Plains.
- Pollution of streams from city sewage and factory waste.
 - What are the damages to public health and wildlife?
- Depletion of American forests.
 - The uses of forests and forest products.
 - How much forest land do we have in the United States?
 - How much did we have when this country was settled?
 - Forest fires—their causes and effects.
- What has happened to forests in your State?

Make maps showing land in forests in early days and now.

What has happened to American wildlife in your State or community?

The effects of resource depletion.

Community life in Syria or North Africa where soil has been exhausted.

Some farming communities in America where erosion has ruined the land.

Some communities that have been damaged by floods, drought, erosion.

Factories, industries, or small businesses of your community that have closed because the resources they need are gone.

Suggested Activities

Field trips to study soil erosion. Visit neighboring field or farm soon after a heavy rain and observe muddy water, sheet erosion, silt collected at foot of slopes. Visit a field that has been abandoned because of severe erosion. What can be done about it?

Field trips to a cutover or burned-over forest; to a reservoir filled with silt; to silt-laden and muddy streams.

Build model farms or exhibits showing the effects of soil erosion, deforestation.

Conduct experiments on the water-absorbing ability and water-holding capacity of different soils. Compare sub-soil with fertile topsoil.

Make a trip to an industrial plant and note which natural resources it uses and how it uses them. Observe any waste. Does the factory dump waste products into a stream and pollute its waters? What effect does water pollution have on plant and animal life? Find out what the community does about pollution and report to the class.

Show film strips, lantern slides, and motion pictures of soil erosion. Have a preview to select some to show to a first grade.

Interview early settlers and ask them to compare your community now with the way they first found it—extent of erosion, lowering or raising of the ground-water table, flood damage, muddy streams, decrease or increase in fish and wildlife. Write an account of your interview for the school paper.

Notes

FIFTH GRADE

CONSERVATION OF NATURAL RESOURCES

Objectives

- To understand the meaning of the term "conservation."
- To understand the difference between conservation of renewable and nonrenewable resources.
- To study some methods commonly used in the conservation of natural resources.
- To understand that the conservation of soil, water, plants, and animals is closely interrelated, such as conserving the birds that eat the insects that destroy our trees.
- To develop positive conservation habits.
- To understand how important conservation is to the well-being of the community and Nation.

Things To Talk About

- What is conservation? Someone has said that conservation is the use, care, and protection of the land and other resources. It means using these resources and, at the same time, keeping them productive. Try making a definition of your own for conservation.
- Renewable and nonrenewable resources.
 - Soil, water, forest, grassland, and wildlife resources are renewable and, therefore, can be used without destroying them.
 - Iron, coal, oil, and many other minerals are nonrenewable.
- Using land for things it can do without wearing it out.
 - Some land is suited for growing crops.
 - Some land is suited for pasture or range.
 - Some land is suited for forest or woodland.
 - Some land is suited for wildlife, recreation, or water supply.
- Conserving water.
 - Water that soaks into the soil aids in plant growth, furnishes water for wells, causes springs to flow, means clear streams.
 - Water that runs off the land carries soil with it, causes floods, causes muddy streams, causes wells and springs to go dry.
- Soil- and water-conservation practices that help to reduce runoff and soil loss.
 - Contour plowing, stripcropping, terracing, small up-stream gully-control dams, and grass waterways on land that is planted to crops.
 - Planting grass, clover, and other thick-growing vegetation on land suited to pasture, but too steep for crops.
 - Controlling grazing of pastureland and protecting it from fire.
 - Planting trees on land that is suited for woodland. Protecting trees from fire, diseases, insects, and overgrazing. Cutting mature and diseased trees on estab-

lished forests; leaving a good stand of healthy, growing trees.

Protecting trees from grazing animals and overbrowsing of domestic livestock and wildlife, such as deer and elk.

Conserving wildlife.

Homes for wildlife—trees, bushes, grass, and other natural vegetation make the best homes for many birds and animals. Clear streams and lakes are best for fish and waterfowl.

Food for wildlife—seeds, plants, fruits, berries, insects, and animals found in nature furnish most of the food; some food may be supplied by us during winter months. Water plants, small fish, and insects furnish food for fish and most waterfowl.

Protection of fish and wildlife by hunting and fishing laws, and wildlife refuges.

Soil, water, forests, and wildlife are interrelated.

Soil and water are necessary for trees, grass, and wildlife.

Trees, grass, and other plants help build and protect the soil, reduce floods, get more water in the ground, keep streams and lakes clear, and furnish food and shelter for fish and wildlife.

How wildlife helps trees, plants, and the soil.

How can city people conserve resources?

Following or during the study and discussion of these subjects, have children make maps, posters, and sketches to illustrate them.

Suggested Activities

- Make field trips to farms where conservation farming is being practiced. Observe the different conservation practices and ask the farmer to explain them. Note the ways in which trees and other plants are used to protect the soil. Note the wildlife homes in shrubs and grass along field borders, streambanks, and roadsides.
- Make field trips to game preserves, fish hatcheries, wildlife refuges, and tree nurseries.
- Build a model farm for the display case in the hall and show conservation farming practices on the farm.
- Make a trip to the community or State fair to observe conservation exhibits.
- Plant trees or grass on eroding land in the schoolyard or at home.
- Show motion pictures, film strips, and lantern slides on conservation.
- Organize a conservation club. Choose a club flower or design an emblem for a pin or armband.
- Make posters showing conservation practices.
- Make a poster showing the watershed in the community.

Notes

SIXTH GRADE

CONSERVATION AND SOCIETY

Objectives

- To study some of the effects of soil erosion and depletion of natural resources on our social and economic life.
- To develop an understanding of the dependence of man and civilization on natural resources.
- To realize that the future prosperity of all individuals, communities, States, and nations depends on a wise conservation program.
- To learn what the State and Federal Governments are doing to conserve resources.
- To appreciate why people everywhere, in cities and country alike, must be interested in conservation of all natural resources.
- To study some of the conservation practices and programs of people in other lands and other times.
- To learn the meaning of a watershed, large or small, in your community; to study resources of the area and their importance to the community.

Things To Talk About

- Soil erosion, deforestation, and wildlife management in other countries and other times.
- Soil erosion in Syria, Palestine, North Africa, and other distant and ancient lands.
- The effects of soil erosion on present-day life of people in Syria, Palestine, North Africa, and other ancient lands.
- Effects of soil erosion and deforestation on the life of people in some American communities.
- Some communities where water erosion has ruined much of the farmland.
- How did the duststorms of the thirties affect the people of the Great Plains?
- How has the unwise cutting of the trees in some forested regions affected the land and the people of those regions?
- The effect of floods, caused largely by deforestation and soil erosion, on the lives of people in some cities along rivers.
- The effect of silt-filled streams, reservoirs, or harbors on people living in the community.

- How are the lives of the people affected where soil erosion and increased runoff cause the drying up of wells and springs?
- Industry and commerce in cities depend on natural resources.
- How would a permanent dust bowl affect the meat-packing industry and grain exchange of Chicago?
- If this country no longer had anything to export because of depleted resources, what effect would it have on New York, Baltimore, San Francisco, and other great harbor cities?
- Thirty percent of the American public hunt or fish for recreation. What businesses would be affected by loss of wildlife?
- Why are governments interested in conservation?
- Individuals die but the State or Nation should go on for many generations.
- To perpetuate North American fish and wildlife species.
- To protect public works, such as reservoirs, harbors, navigable streams, and public lands.
- To prevent floods and destruction of property.
- Why urban people are interested in conservation.
- Some things that people in ancient and foreign lands have done about conservation.
- Bench terraces in China, Lebanon, and other ancient lands.
- How Holland reclaimed land from the sea.
- The irrigation works of ancient Babylon.
- What can children do about conservation?

Suggested Activities

- Take part in paper, scrap iron, and other salvage programs.
- Plant trees or grass on eroding lawn at home or on school grounds.
- Start a school woodlot. Plan the work with other classes so that the activity can become a whole-school project.
- Plant shrubs and grass for wildlife food and cover.
- Build bird feeders and houses for songbirds.
- Make a scrapbook about conservation in ancient and foreign lands.
- Write themes about conservation, articles for school newspaper.

Notes

SEVENTH AND EIGHTH GRADES

THE SCIENCE OF CONSERVATION

Objectives

- To learn some ways science is used in conserving natural resources.
- To study some soil and water conservation practices now in common use.
- To learn the value of some common soil and water conservation practices.
- To learn how soil and water conservation has benefited those who practice it.
- To appreciate the fact that science has only natural raw material to work with and cannot overcome all resource deficiencies.
- To develop positive conservation habits, such as pouring water on a camp fire to avoid forest fires.

Things To Talk About

- To learn interrelationship of soil, water, vegetation, and animals (ecology).
- Some ways science is being used to help solve the conservation problem.
 - Results of some experiments on soil and water conservation.
 - Some new uses for waste products of farm, forest, and factory.
 - Some substitutes for seriously depleted resources.
 - Why farmers need the help of scientists.
- Some soil and water conservation practices common to the community or the watershed.
 - Contour tillage—kinds, how done, and why used.
 - Stripcropping, kinds, how installed, and why used.
 - Terracing—kinds, how installed, and why used.
 - Crop rotation—kinds, how installed, and why used.
 - Fertilizing and liming—how applied and why used.
 - Mulching—kinds; how and why used.
 - Drainage—kinds, how installed, and why used.
 - Irrigation—kinds, how installed, and why used.
 - Pasture and range management—methods and value.
 - Contour furrows on pasture and range land—how installed and why used.
 - Water spreading—how and why used.
 - Woodland management—methods and value.
 - Wildlife habitat management.
 - Farm-pond management.
 - Field windbreaks (or shelterbelts)—kinds and why used.
 - Farmstead windbreaks—kinds and why used.

- How machinery companies are helping by designing new equipment.
 - Whirlwind terracer.
 - Field cultivator.
 - Trash tillage equipment.
 - Land-leveling equipment.
 - Drainage and irrigation equipment.
- Some economic benefits from conservation farming.
 - Increased crop yields.
 - Increased value of the land.
 - Higher standard of living. Better flood control and less reservoir silting, damage to roads, and stream pollution.
- Need for a scientific land-capability inventory of a farm.
 - To determine the capability of a patch of land based on kind of soil, slope, extent of erosion, and past use.
 - To understand the eight classes of land according to capability.
 - To suggest what practices are needed to conserve the soil.
- Some conservation practices used by industries of the community. The economic value of these practices.

Suggested Activities

- Obtain land-capability maps of some farms from nearby or local soil conservation districts. Study the maps and then take them to the farms where they were made and compare the way the farmer is using the land with the land capability as shown on the map.
- Study some soil conservation practices on local farms and have the farmer explain their value and how they were installed.
- Borrow a farm level or make a simple farm level and practice running contour lines on the school ground or a neighboring field.
- Prepare a conservation exhibit for a local fair or for a school exhibit.
- Visit a farm machinery or implement store or factory.
- Participate in a soil conservation or land-judging project.
- Show motion pictures, film strips, lantern slides, and charts on conservation.
- Visit a nearby well-managed forest. Get advice from a local forester.
- While on a field trip, make a map of a farm or landscape, showing land suitable for growing crops; land suitable for forests, brush, or wildlife areas; and land suitable for pastures.

Notes

SOIL CONSERVATION SERVICE STATE OFFICES

The following State Offices will supply publications, motion pictures, charts, and posters on soil and water conservation and insofar as possible furnish speakers, tour guides, and other assistance to schools in their conservation work:

State Conservationist,
Soil Conservation Bldg.,
Alabama Polytechnic Institute Campus, Box 311,
Auburn, Ala.

State Conservationist,
223 New Post Office Building,
Phoenix, Ariz.

State Conservationist,
323 Federal Building,
Little Rock, Ark.

State Conservationist,
Tioga Building, Second Floor,
2020 Milvia Street,
Berkeley 4, Calif.

State Conservationist,
New Customhouse,
Denver 2, Colo.

State Conservationist,
College of Agriculture Building,
University of Connecticut, Box U-105,
Storrs, Conn.

State Conservationist,
503 Academy Street, Box 418,
Newark, Del.

State Conservationist,
35 North Main Street, Box 162,
Gainesville, Fla.

State Conservationist,
Old Post Office Building, Box 832,
Athens, Ga.

State Conservationist,
Annex B—Western Idaho,
State Fairgrounds, Box 2709,
Boise, Idaho.

State Conservationist,
Nogle Building,
605 South Neil Street,
Champaign, Ill.

State Conservationist,
215 East New York Street,
Indianapolis 4, Ind.

State Conservationist,
Iowa Building,
505 Sixth Avenue,
Des Moines, Iowa.

State Conservationist,
Public Utility Building,
114½ West Iron Street, Box 600,
Salina, Kans.

State Conservationist,
Production and Marketing Building,
231 West Maxwell Street,
Lexington, Ky.

State Conservationist,
Svebeck Building,
1517 Sixth Street,
Alexandria, La.

State Conservationist,
University of Maine,
East Annex Building,
Orono, Maine.

State Conservationist,
228 Agriculture Building,
University of Maryland,
College Park, Md.

State Conservationist,
Cooks Block,
6 Main Street,
Amherst, Mass.

State Conservationist,
Michigan State College,
Wells Hall, Unit E,
East Lansing, Mich.

State Conservationist,
517 Federal Courts Building,
St. Paul, Minn.

State Conservationist,
Milner Building,
Lamar and Pearl Streets, Box 610,
Jackson 105, Miss.

State Conservationist,
Federal Building,
Sixth and Cherry Streets, Box 180,
Columbia, Mo.

State Conservationist,
26 East Mendenhall, Box 855,
Bozeman, Mont.

State Conservationist,
134 South 12th Street,
Lincoln, Nebr.

State Conservationist,
1485 Wells Avenue,
Reno, Nev.

State Conservationist,
29 Main Street,
Durham, N. H.

State Conservationist,
Feher Building,
103 Bayard Street, Box 670,
New Brunswick, N. J.

State Conservationist,
Office Square Building,
1015 Tijeras Avenue, NW, Box 1348,
Albuquerque, N. Mex.

State Conservationist,
Byrns Building,
238 West Genesee Street,
Syracuse, N. Y.

State Conservationist,
213 PMA Building,
State College Station, Box 5126,
Raleigh, N. C.

State Conservationist,
Professional Building,
Fifth and Rosser Streets, Box 270,
Bismarck, N. Dak.

State Conservationist,
222 Old Federal Building,
Third and State Streets,
Columbus 15, Ohio.

State Conservationist,
2800 Southeastern Avenue, Box 1377,
Oklahoma City, Okla.

State Conservationist,
Ross Building, 209 Southwest Fifth Avenue,
Portland 4, Oreg.

State Conservationist,
Dauphin Building, 203 Market Street,
Harrisburg, Pa.

Rhode Island combined with Connecticut.

State Conservationist,
Federal Land Bank Building,
1401 Hampton Street,
Columbia, S. C.

State Conservationist,
Knights of Columbus Building,
56 Third Street, SE, Box 1357,
Huron, S. Dak.

State Conservationist,
561 United States Courthouse,
Nashville 3, Tenn.

State Conservationist,
First National Bank Building,
16-20 South Main Street, Box 417,
Temple, Tex.

State Conservationist,
222 Southwest Temple,
Salt Lake City 1, Utah.

State Conservationist,
481 Main Street, Box 736,
Burlington, Vt.

State Conservationist,
900 North Lombardy Street,
Richmond 20, Va.

State Conservationist,
301 Hutton Building,
South 9 Washington Street,
Spokane 4, Wash.

State Conservationist,
Lazzelle Building, 178 Forest Avenue,
Morgantown, W. Va.

State Conservationist,
3010 East Washington Avenue,
Madison 4, Wis.

State Conservationist,
Tip Top Building,
345 East Second Street, Box 699,
Casper, Wyo.

Territorial Conservationist,
Post Office Box F,
Palmer, Alaska.

Territorial Conservationist,
Federal Building,
Merchant and Mililand Streets,
Honolulu, Hawaii.

Director, Caribbean Area,
Segarra Building,
1409 Ponce de Leon Avenue, Box 4671,
San Juan 23, Puerto Rico.

VISUAL TEACHING AIDS

Motion Pictures: A number of motion pictures, both sound and silent, 16 mm. and 35 mm., showing phases of conservation, are available from various agencies of the Federal Government and from some State departments of conservation and State departments of education. Federal agencies from which these films are available include: Soil Conservation Service, Forest Service, and Fish and Wildlife Service. Many farm-machinery manufacturers and other commercial concerns also have good mo-

tion pictures on conservation. Also, the Rural Department of the National Education Association has a movie on the study of soil.

Charts and Posters: Some attractive charts and posters on various phases of conservation are available from the same sources as motion pictures. Several farm-machinery manufacturers and other commercial concerns have materials of this kind also.

REFERENCES

Because conservation of all natural resources is so closely tied together, any list of references on conservation of soil and water will inevitably include some books that emphasize other natural resources than soil and water. On the other hand, a short list cannot include all of the books published on soil and water conservation. All of these books, however, discuss conservation of one or more of the natural resources.

Single copies of United States Department of Agriculture publications listed here are available free to teachers from the State Soil Conservation Service offices listed on p. 9 and from the United States Department of Agriculture and the Soil Conservation Service, Washington, D. C.

- | | Grade |
|---|-------|
| My Land and Your Land Conservation Series: 1 | |
| Nature's Bank—The Soil; Raindrops and Muddy Rivers; Plants and Animals Live Together; and Would You Like To Have Lived When? National Wildlife Federation, Inc., Washington, 1953. Series of 4, \$1. | |
| Life on the Farm. By Mae McCrory. Little Wonder Book No. 213. Charles E. Merrill Books, Columbus, Ohio, 1954. 32 pp., illus. 20 cents. | 1-2 |
| Plants Round the Year. By Glenn O. Blough. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1953. 36 pp., illus. 36 cents. | 1-2 |
| The Crop That Did Not Fail. International Paper Co., New York, 1951. 16 pp., illus. Free. | 1-2 |
| How Do We Know. By Wilbur L. Beauchamp, Gertrude Crampton, and William S. Gray. Scott, Foresman & Co., New York, 1952. 96 pp., illus. \$1.38. | 1-3 |
| Let's Save Soil With Sam and Sue. Prepared by the Alabama Polytechnic Institute. Reproduced by the Soil Conservation Service, U. S. Dept. of Agr., 1951. 28 pp., illus. For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. 20 cents. | 1-3 |
| Pogo's Farm Adventure. By Jo and Ernest Norling. Henry Holt & Co., New York, 1948. 46 pp., illus. \$1.14, plus postage. | 1-3 |
| The Wonderworld of Science, Book I. By Warren Knox, George Stone, Morris Meister, and Doris Noble. Charles Scribner's Sons, New York, 1950. 136 pp., illus. \$1.20. | 1-3 |
| Making and Using Classroom Science Materials in the Elementary School. By Glenn O. Blough and Marjorie H. Campbell. The Dryden Press, Inc., New York, 1954. 229 pp., illus. \$2.75. | 1-6 |
| Conservation Chart, five colors, 28 by 44 inches; with accompanying text, 25 pages. Sport Fishing Institute, Bond Building, 14th and New York Avenue, NW, Washington, D. C. Chart and text, 60 cents. Discount for quantities. | 1-8 |
| The First Book of Conservation. By F. C. Smith. Franklin Watts, Inc., New York, 1954. 68 pp., illus. \$1.95. | 1-8 |
| Living Together in the Modern World. Volume 7, Conservation of Natural Resources. Creative Educational Society, Inc., Mankato, Minn., 1953. Illus. \$5.95. | 1-8 |
| Soil. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1943. 36 pp., illus. 36 cents. | 2 |
| Saving Our Wildlife. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1944. 36 pp., illus. 36 cents. | 2 |
| Plant Factories. By Bertha Morris Parker and Orlin D. Frank. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1944. 36 pp., illus. 36 cents. | 2-3 |
| Science Through the Year. By Gerald S. Craig and Etheleen Daniel. Ginn & Co., New York, 1950. 224 pp., illus. | 2-3 |
| Not Only for Ducks—The Story of Rain. By Glenn O. Blough. A Whittlesey House Book. McGraw-Hill Book Co., Inc., New York, 1954. 48 pp., illus. \$2.25. | 2-4 |
| Partners With Nature. By Ivah Green. D. Van Nostrand Co., Inc., New York, 1950. 112 pp., illus. \$1.60. | 2-4 |
| Trees. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1941. 36 pp., illus. 36 cents. | 3-4 |
| The Earth a Great Storehouse. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1941. 36 pp., illus. 36 cents. | 3-4 |

	Grade		Grade
Water. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1944. 36 pp., illus. 36 cents.	3-4	Conquest of the Land Through 7,000 Years. By W. C. Lowdermilk. U. S. Dept. of Agr. Agriculture Information Bulletin 99, 1953. 32 pp., illus.	4-8
Reading Adventures. Book B. Charles E. Merrill Books, Columbus, Ohio, [n. d.] 48 cents.	3-4	Who Lives on the Forest Farm? (Comic Book and Suggestions for Teachers). International Paper Co., New York, 1954. 16 pp., illus. Free.	4-8
The Wonderworld of Science, Book Three. By Warren Knox, George Stone, Morris Meister, and Doris Noble. Charles Scribner's Sons, New York, 1950. 200 pp., illus. \$1.32.	3-4	Our Daily Bread. By Susan Myrick. The Interstate Printers & Publishers, Danville, Ill., 1950. 212 pp., illus. \$2.	4-8
Trees. By Lillian McKee. Little Wonder Book No. 407. Charles E. Merrill Books, Columbus, Ohio, 1952. 32 pp., illus. 20 cents.	3-4	Know Your Watersheds. By the Forest Service. U. S. Dept. of Agr. Leaflet 282, 1948. 16 pp., illus.	4-8
Our Land of Farms. By Dorothy Hall. Little Wonder Book No. 502. Charles E. Merrill Books, Columbus, Ohio, 1952. 32 pp., illus. 20 cents.	3-4	The Wonderworld of Science, Book Five. By Warren Knox, George Stone, Morris Meister, and Dorothy Wheatley. Charles Scribner's Sons, New York, 1950. 264 pp., illus. \$1.56.	5-6
Pioneering in Agriculture. By Ted Badley. Little Wonder Book No. 402. Charles E. Merrill Books, Columbus, Ohio, 1954. 32 pp., illus. 20 cents.	3-4	Science Every Day. By Gerald S. Craig and Sara E. Baldwin. Ginn & Co., New York, 1950. 252 pp., illus.	5-6
The Treasure of Greenbar Island. By Judy Ellis. Julian Messner, Inc., New York, 1953. 63 pp., illus. \$1.60.	3-5	Rocks, Rivers and the Changing Earth. By Herman and Nina Schneider. William R. Scott, Inc., New York, 1952. 181 pp., illus. Drawings by Edwin Herron. \$3.	5-6
The Story of Land—Its Use and Misuse (Comic Book). The Soil Conservation Society of America, 1016 Paramount Building, Des Moines 9, Iowa, 1955. 16 pp., illus. Single copies, 20 cents; 10 to 100, 10 cents each; more than 100, 7½ cents or less.	3-8	David's Ranch. By Don Wilcox. Julian Messner, Inc., New York, 1954. 62 pp., illus. \$1.60.	5-6
Fire, Friend and Foe. By Bertha Morris Parker. The Basic Science Education Series. Row Peterson & Co., Evanston, Ill., 1952. 36 pp., illus. 36 cents.	4	Agriculture. By Violet M. Raynor. Little Wonder Book No. 415. Charles E. Merrill Books, Columbus, Ohio, 1954. 32 pp., illus. 20 cents.	5-6
Gabby and the Forest Fires. By Ellen C. Dowling. The American Tree Association, Washington, 1947. 52 pp., illus. Drawings by Ed Nofziger. 10 cents.	4	Youth Can Help Conserve These Resources—Soil, Water, Woodland, Wildlife, Grass. By the Soil Conservation Service. U. S. Dept. of Agr. Agriculture Information Bulletin 52, 1951. 24 pp., illus.	5-6
The Wonderworld of Science, Book Four. By Warren Knox, George Stone, Morris Meister, and Dorothy Wheatley. Charles Scribner's Sons, New York, 1950. 232 pp., illus. \$1.41.	4-5	Reading Adventures, Book C. Charles E. Merrill Books, Columbus, Ohio, [n. d.] 48 cents.	5-6
Thanks to Trees. By Irma E. Webber. William R. Scott, Inc., New York, 1952. 60 pp., illus. \$2.	4-5	Balance in Nature. By Bertha Morris Parker and Ralph Buchsbaum. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1952. 36 pp., illus. 36 cents.	5-6
Ask the Weatherman. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1941. 36 pp., illus. 36 cents.	4-6	Our Forest Resources: What They Are and What They Mean to Us. By Charles E. Randall. U. S. Dept. of Agri. Agriculture Information Bulletin 131, 1954. 37 pp., illus.	5-8
Conservation in America. By Mary I. Curtis. Lyons & Carnahan, Chicago, 1947. 118 pp., illus. 90 cents.	4-6	Water, Water Everywhere. By Mary Walsh. Abingdon-Cokesbury Press, New York, 1953. 48 pp., illus. \$2.	5-8
Our Productive Land—We Can Conserve and Improve It While Using It. By the Soil Conservation Service. U. S. Dept. of Agr. Agriculture Information Bulletin 106, 1953. 16 pp., illus.	4-8	Billy Bass. Al Alligator.	5-8
The Soil That Went to Town. By C. W. Gee. U. S. Dept. of Agr. Agriculture Information Bulletin 95, 1952. 20 pp., illus.	4-8	Tommy Trout. Mac Mallard.	
		Bobby Bluegill. Willie Whitetail.	
		Charley Cottontail. Woody Woodcock.	
		Bob White. Freddy Fox Squirrel.	
		By R. W. Eschmeyer. Fisherman Press, Inc., Oxford, Ohio, 1941, 1952, and 1953. 48 pp., illus. with drawings. 50 cents each, paperbound; \$1 each, clothbound.	
		Making Land Produce Useful Wildlife. By Wallace L. Anderson. U. S. Dept. of Agr. Farmers' Bulletin 2035, 1951. 32 pp., illus.	5-8

	Grade		Grade
Your Soil—Crumbly or Cloddy? By A. M. O'Neal and A. A. Klingebiel. U. S. Dept. of Agr. Leaflet 328, 1952. 8 pp., illus.	5-8	First Things First—Know Your Land and Have a Plan Before Starting Conservation Farming. By Albert B. Foster. U. S. Dept. of Agr. Soil Conservation Service Program Aid 69, 1949. 8 pp., illus.	6-8
How To Recognize Erosion in the Northeast. By William W. Reitz. U. S. Dept. of Agr. Agriculture Information Bulletin 27, 1950. 16 pp., illus.	5-8	Freedom and Plenty—Ours to Save. By Wilfred S. Bronson. Harcourt, Brace & Co., New York, 1953. 124 pp., illus. \$2.95.	6-8
Idea Book for Conservation Clubs. By Howard Mendenhall. Society for the Protection of New Hampshire Forests, Concord, N. H., 1954. 17 pp. 25 cents. [Mimeographed.]	5-8	A Desert in Your Own Backyard. National Wildlife Federation, Inc., Washington [n. d.] 14 pp., illus. 1 to 5 copies free; 5 copies or more, 7 cents each.	6-8
Stories Read From the Rocks. By Bertha Morris Parker. The Basic Science Education Series. Row, Peterson & Co., Evanston, Ill., 1941. 36 pp., illus. 36 cents.	6-8	The Wonderworld of Science, Book Seven. By Morris Meister, Ralph E. Keirstead, and Lois M. Shoemaker. Charles Scribner's Sons, New York, 1950. 360 pp., illus. \$1.80.	7-8
Conservation in Camping. By the American Camping Association in cooperation with the Soil Conservation Service. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 1952. 26 pp., illus. 20 cents.	6-8	Science Plans for Tomorrow. By Gerald S. Craig and John Urban. Ginn & Co., New York, 1951. 448 pp., illus.	7-8
Wildlife for America—The Story of Wildlife Conservation. By Edward H. Graham and William R. Van Dersal. Oxford University Press, Inc., New York, 1949. 109 pp., illus. \$2.50.	6-8	Technical Skill for Soil and Water Conservation. U. S. Dept. of Agr. Soil Conservation Service Program Aid 86, 1950. 16 pp., illus.	7-8
Exploring in Science. By Gerald S. Craig and Beatrice Davis Hurley. Ginn & Co., New York, 1950. 319 pp., illus.	6-8	Science Activities, Book Two. By T. W. Hunt and H. C. Andrews. W. J. Gage & Co., Ltd., Toronto, 1941. 252 pp., illus. 75 cents.	7-8
Ranger 'Rithmetic. By Forest Service. U. S. Dept. of Agr., Washington, 1949. 11 pp., illus.	6-8	Save America Series, Thirteen Approaches to Conservation. National Wildlife Federation, Inc., Washington, 1940. Series of 13 pamphlets. 25 cents.	7-8
Son of the Forest. By Arthur H. Carhart, J. B. Lippincott Co., New York, 1952. 244 pp., illus. \$2.50.	6-8	This Is Our Soil. By Ernest D. Walker and Albert B. Foster. The Interstate Printers & Publishers, Danville, Ill., 1949. 48 pp., illus. 30 cents.	7-8
New Ideas in Science. By Gerald S. Craig and Margaret Oldroyd Hyde. Ginn & Co., New York, 1950. 377 pp., illus.	6-8	Soil Conservation Work Book. Superintendent of Schools, Woodbury County, Sioux City, Iowa, [n. d.] 44 pp. 14 cents. Teacher's Guide for Soil Conservation. 18 cents.	7-8
The Land Renewed. By William R. Van Dersal and Edward H. Graham. Oxford University Press, New York, 1946. 110 pp., illus. \$2.	6-8	Grass Crops in Conservation Farming. By Tom Dale and Grover F. Brown. U. S. Dept. of Agr. Farmers' Bulletin 2080, 1955. 24 pp., illus.	7-8
		Facts About Wind Erosion and Dust Storms. By Soil Conservation Service. U. S. Dept. of Agr. Leaflet 394, 1955. 8 pp., illus.	7-8

Notes

BOOKS FOR TEACHERS AND ADVANCED STUDENTS

In addition to other references listed here, the school library might include some or all of the following books for use by teachers and advanced pupils who wish to make a more extensive study of conservation.

Wildlife Conservation. By Ira N. Gabrielson. The Macmillan Co., New York, 1942. 250 pp., illus. \$4.75.

Our Wildlife Legacy. By Durward L. Allen. Funk & Wagnalls, New York, 1954. 422 pp., illus. \$5.

Conservation in the United States. By A. F. Gustafson, C. H. Guise, W. J. Hamilton, Jr., and H. Ries. Comstock Publishing Co., Inc., Ithaca, N. Y., 1949. 534 pp., illus. \$5.

Elements of Soil Conservation. By H. H. Bennett. McGraw-Hill, New York, 1955. Ed. 2, 358 pp., illus. \$3.96.

This Is Our Land, The Story of Conservation in the United States. By E. G. Cheyney and T. Schantz-Hansen. The Webb Publishing Co., St. Paul, Minn., 1950. 345 pp., illus. \$3.20 to teachers.

Road to Survival. By William Vogt. William Sloane Associates, Inc., New York, 1948. 335 pp. \$4.

Our Plundered Planet. By Fairfield Osborn. Little, Brown & Co., Boston, 1952. 217 pp. \$3.

Large Was Our Bounty. 1948 Yearbook, Association for Supervision and Curriculum Development of the National Education Association, Washington, 1948. 216 pp., illus. \$2.50.

Conservation Education in American Schools. Twentieth Yearbook, American Association of School Administrators. A Department of the National Education Association of the United States, 1951. 527 pp., illus. \$4.

Handbook on Teaching Conservation and Resource-Use. By the Conservation Project of the National Association

tion of Biology Teachers. Interstate Printers and Publishers, Danville, Ill., 1955. 504 pp., illus. \$4.

Methods and Activities in Elementary-School Science. By Glenn O. Blough and Albert J. Huggett. The Dryden Press, Inc., New York, 1951. 310 pp., illus. \$3.75.

American Resources, Their Management and Conservation. By J. Russell Whitaker and Edward A. Ackerman. Harcourt, Brace & Co., New York, 1951. \$6.75.

Materials To Help Teach Forest Conservation. (List of Teaching Aids.) By Forest Service. U. S. Dept. of Agr. K-28, Washington, 1953. 4 pp. Free.

School Camping, a Frontier of Curriculum Improvement. By John W. Gilliland. Association for Supervision and Curriculum Development, National Education Association, Washington, D. C., 1954. 58 pp., illus. 75 cents.

Books, Booklets, and Bulletins on Soil and Water Conservation. Compiled by Phoebe O'N. Harrison. U. S. Dept. of Agr. Agriculture Information Bulletin 63, 1953. 32 pp.

Program of the Modern Camp. Edited by Gerald P. Burns. Prentice-Hall, Inc., New York, 1954. 320 pp., illus. [pp. 223-227 on Conservation.] \$5.65.

Bibliography of Conservation, Books, Booklets, and Teaching Aids. National Wildlife Federation, Inc., Washington, 1954. 44 pp. Free.

Teachers Guide for How Do We Know. By Wilbur L. Beauchamp, Gertrude Crampton, and William S. Gray. Scott, Foresman & Co., New York [n. d.] \$1.38.

Elementary-School Science and How To Teach It. By Glenn O. Blough and Albert J. Huggett. The Dryden Press, New York, 1951. 532 pp., illus. \$5.75.

Native Land—Our Common Stake in Conservation of Our Renewable Natural Resources. National Association of Manufacturers, Education Division, New York, 1955. 46 pp., illus. Free to teachers.